

**LARP**

**US LHC Accelerator Research Program**

***bnl - fnal- lbnl - slac***

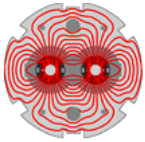
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# LHC Commissioning Task Force

Vladimir Shiltsev

for the LHC Commissioning Task Force

(W.Fischer, G.Ganetis, M.Lamm, A.McInturff,  
T.Raubenheimer, V.Shiltsev, M.Zisman)

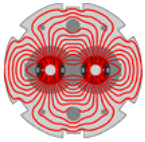


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# General Info on the CTF

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- Induced by S.Peggs Letter of Feb 16, 2005
- Charge:
  - Present a working draft of a ``white paper" recommending an integrated plan for the organization of LARP participation in LHC commissioning, at the LARP collaboration meeting April 6-8, 2005.
  - Present a final draft of the white paper to the CERN-U.S. Committee when it meets next (summer 2005).
  - Evaluate LARP planning for involvement in LHC beam commissioning, in consultation with Mike Syphers and Elvin Harms.
  - Recommend the extent of any additional scope of LARP involvement in Hardware Commissioning, assuming formal endorsement and support by DOE and U.S. lab directorates of a LARP role in its organization. Evaluate the desirability of merging commissioning components 2 and 3, into a single Task addressing broad hardware commissioning of just the interaction regions.
  - Recommend the appropriate role of ``Toohig fellows" -- defined, for example, as new or recent PhD accelerator physicists or engineers hired by LARP to serve for 12 months of their 2 or 3 year post-doc terms at CERN.

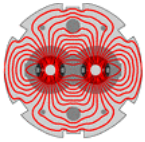


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## CTF (cont'd)

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- CTF members represent the US-LARP labs :
  - Fermilab TD M.Lamm
  - Fermilab AD V.Shiltsev
  - Brookhaven CAD W.Fischer
  - Brookhaven SMD G.Ganetis
  - Berkeley AFRD M.Zisman
  - Berkeley ED/MP A.McInturff
  - SLAC T.Raubenheimer

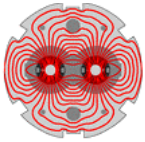


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## CTF (cont'd)

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- Worked via E-mailing and Video-Conferencing (3)
- 6 out of 7 are present here (at Port Jeff)
  - To report progress
  - To meet in person
  - To continue (boost) the work
- Work to be finished by CERN-US Executive Committee meeting in ~July 2005

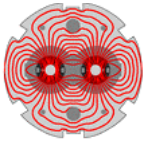


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# Participation in LHC Commissioning

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- Benefits to the US HEP program:
  - overall benefit if the LHC turns on rapidly and successfully:
    - support of the US investment in the LHC
    - secure future accelerator based HEP projects in the US
  - the information and experience gained will be available for:
    - the LHC upgrades
    - the ILC (e.g., on large 2K systems) and other future machines
  - train younger staff
  - advance international cooperation
  - possibility to conduct forefront accelerator physics R&D

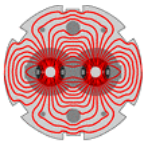


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# Scale of US→LHC Commissioning

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- Hardware Commissioning (including installation):
  - Recent count shows 100.5 people missing:
    - For ~14 mos period → 117 FTEs
    - Approx ½ of them (~45 FTEs) Engineers and Physicists
    - Expertise needed: Cryo Instr, Cryo Controls, Quench Protection, Machine Interlocks, Elect-Eng, Commissioning Coordinators, Accel. Instrum. Controls
    - FY'06—FY'07
- Beam Commissioning:
  - LARP goal to have 1 US rep /LHC shift
  - ~(6-7) FTEs/ year of beam commissioning
  - FY'08-FY'09 (? FY'10 ?) → 12-21 FTEs

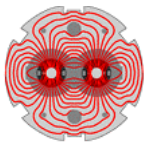


# Possibilities of Participation Depend On:

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- Funding:
  - Installation/Additional Hardware – not identified yet
  - Beam/Deliverables Commissioning – by LARP
- Schedule/Compatibility with US Lab Programs
  - HC in FY'06-'07, BC in FY'08 and beyond
  - Still many uncertainties on CERN and US sides
  - More details → Wed PM session
- Available Human Resources:
  - CTF members approached management of corresponding labs and explained/discussed the issue
  - Estimated # of Engineers and Physicists possibly available for the ½ to 1 year commitment and got blessing from higher management to count on them
  - Have very preliminary lists of names



# US Long Term Commissioning Visits FTEs

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(IR, Installation, Cmss'ng)

Hardware Commis'ng

Beam Commiss'g

Laboratory “realistic” → extended

“realistic” → extended

Fermilab

4 → 11.5

6 → 15

Brookhaven

0 → 0

0 → 2 + 1\*

Berkeley

1 → 1 + 2\*

1\* → 2 + 1\*

SLAC

0 → 0

? → 1 ?

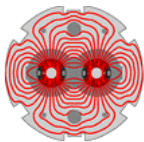
**TOTAL**

**5 → 14.5**

**7 → 22**

\* means the person have to be hired





# New Hires? E.g. Toohig Fellowships



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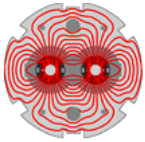
Beginning in 2006, the U.S. LHC Accelerator Research Program (LARP) is looking for candidates with recent PhD's in Accelerator Physics or Accelerator Engineering to participate in:

- 1) LHC commissioning, and/or
- 2) an Interaction Region upgrade.

Toohig Fellowships last 2 years, extendible by 1 year, with approximately equal time spent at a U.S. lab (BNL, FNAL, LBNL, or SLAC) and at CERN.

If you are interested, please send a resume or contact Peter Limon (pjlimon@fnal.gov) or Steve Peggs (peggs@bnl.gov)

See <http://www.rhichome.bnl.gov/LARP> for LARP information

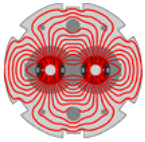


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# Living Abroad Issues

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- Longer Term Visit Issues
  - 6 to 12 months
  - Move family/schools
  - Travel/Relocation expenses
  - Salary adjustment to cost of living
  - Insurance
  - Extra money from CERN (“Project Associate” Status)
  - Taxation
  - ...many more....
- The visits should look attractive in order to bring more people
- We just started to explore these issues:
  - Got Memo from FNAL Personnel Dept
  - First look into taxation issues
  - Compare with US-CMS guidances

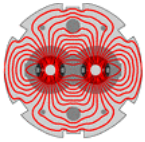


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# CTF Recommendations (preliminary)

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- We endorse the idea that LARP can be effectively used for organization of US involvement in the LHC commissioning. We recommend to form a Machine Com-missioning Project (MCP) within LARP for that purpose:
  - The MCP to include hardware(HC) and beam commissioning (BC)
  - HC to include “IR commissioning”, “installation” and “additional hardware commissioning”
  - HC and BC leader to approach individuals in the US labs. The CTF memebbers can help.
- To launch the HC, a formal Request Letter is needed from CERN followed by the US response:
  - Funding and Scheduling HC to be addressed ASAP
  - Urgency to organize HC to become effective in FY'06

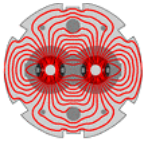


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# CTF Recommendations (cont'd)

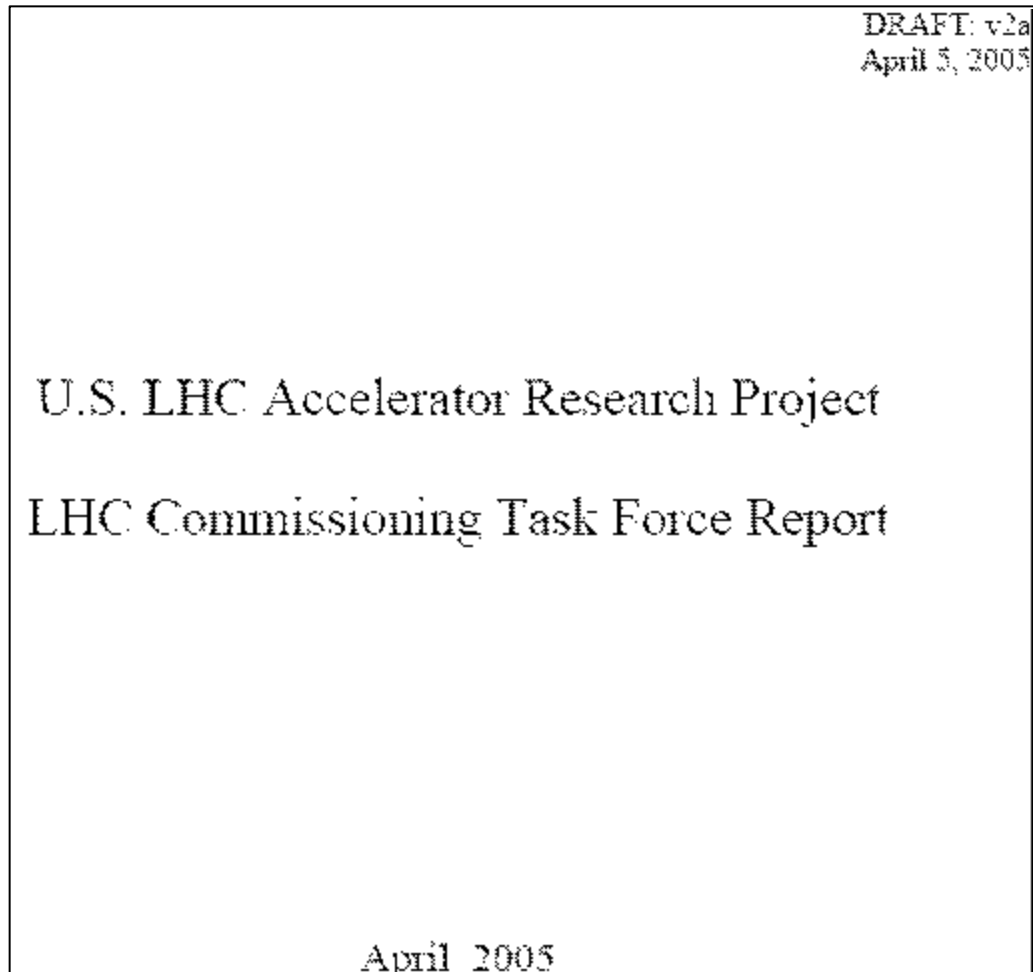
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- Involvement of junior staff is important:
  - Definitely, in Beam Commissioning
    - May be less practical for HC
  - We recommend “pairing” with more experienced people
    - Short term visits to collaborate/supervise younger staff to be supported by LARP
    - Remote Read-Only Control Room in the US may be useful
  - Full support Toohig Fellowship program
    - needs to be launched in 2005
    - Many issues not addressed yet (P.Limon to report at Wed PM session)
- Possibilities to combine commissioning of other US LARP deliverables with participation in “generic” beam commissioning should be explored

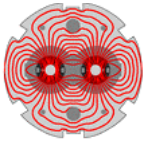


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# CTF Report (“White Paper”)



- Will address:
  - Resources missing
  - MC organization within LARP
  - Benefits to US
  - Possibilities at 4 labs
  - Funding Issues
  - Living Abroad
- Recommendations
- Paper
  - Now *ver.2a* exists
  - finished in Apr-May
  - US release in June
  - Final ~July '05



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# General Conclusions

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- Recently formed CTF is functioning
- Preliminary investigations show that US labs can provide 1/9 to 1/3 of the man-power missed (and needed) for the LHC installation and hardware commissioning and ½ to 100% of personnel LARP want to employ in the beam commissioning.
- Organization of the US contribution to the LHC commissioning has to be energized, and the CTF is forming recommendations on that subject
- We are in a good shape to present a comprehensive report in July'05